

## Claims

- [c1] What is claimed is:
1. A writing power control method of a compact disc drive for determining the writing power used for writing data onto a compact disc; the writing power control method comprising:
    - (a) constructing a polynomial function which represents a relationship between a writing power and a target read-back signal parameter;
    - (b) retrieving the target read-back signal parameter from the compact disc;
    - (c) determining a first writing power corresponding to the target read-back signal parameter according to the polynomial function;
    - (d) performing a writing test procedure using the first writing power to determine a real read-back signal parameter;
    - (e) comparing the real read-back signal parameter with the target read-back signal parameter; and
    - (f) if a difference between the real read-back signal parameter and the target read-back signal parameter is less than a predetermined value, writing data in the compact disc using the first writing power.
  - [c2] 2. The writing power control method of claim 1 wherein if the difference between the real read-back signal parameter and the target read-back signal parameter is greater than the predetermined value, step(e) further comprises shifting the polynomial function according to the real read-back signal parameter, determining a second writing power according to both the shifted polynomial function and the target read-back signal parameter, and performing the writing test procedure again until the difference between the real and target read-back signal parameters is less than the predetermined value.
  - [c3] 3. The writing power control method of claim 1 wherein the compact disc comprises a power calibration area (PCA) for performing the writing test procedure to determine the writing power.
  - [c4] 4. The writing power control method of claim 3 wherein the power calibration area comprises a test area for performing the writing test procedure and a count area for recording an execution number of the writing test procedure, the

- Page 10 of 20

[c10] 10.A writing power control method of a compact disc drive for determining the writing power used for writing data onto a compact disc;  
the writing power control method comprising:  
(a)constructing a polynomial function which represents a relationship between a writing power and a target read-back signal parameter;  
(b)retrieving the target read-back signal parameter from the compact disc;  
(c)determining a first writing power corresponding to the target read-back signal parameter according to the polynomial function;  
(d)performing a writing test procedure using the first writing power to determine a real read-back signal parameter;  
(e)comparing the real read-back signal parameter with the target read-back signal parameter; and  
(f)if a difference between the real read-back signal parameter and the target read-back signal parameter is greater than the predetermined value, shifting the polynomial function according to the real read-back signal parameter, determining a second writing power according to the shifted polynomial function and the target read-back signal parameter, and performing a writing test procedure again until the difference between the real and target read-back signal parameters is less than the predetermined value to determine the writing power of the compact disc drive.

[c11] 11. The writing power control method of claim 10 wherein if the difference between the real read-back signal parameter and the target read-back signal parameter is less than the predetermined value, step(e) further comprises writing data in the compact disc using the first writing power.

[c12] 12. The writing power control method of claim 10 wherein the compact disc comprises a power calibration area (PCA) for performing the writing test procedure to determine the writing power.

[c13] 13. The writing power control method of claim 12 wherein the power calibration area comprises a test area for performing the writing test procedure and a count area for recording an execution number of the writing test procedure, the test area comprises a plurality of blocks, each block is capable of performing

the writing test procedure once, and the writing test procedure comprises:  
selecting successive blocks from the test area;  
performing the writing test procedure on the successive blocks using the first  
writing power; and  
determining the real read-back signal parameter according to an average result  
of read-back signal parameters obtained from a plurality of middle blocks of  
the successive blocks.

- [c14] 14. The writing power control method of claim 12 wherein the power calibration area comprises a test area for performing the writing test procedure and a count area for recording an execution number of the writing test procedure, the test area comprises a plurality of blocks, each block is capable of performing the writing test procedure once, and the writing test procedure comprises: selecting successive blocks from the test area; performing the writing test procedure on the successive blocks using the first writing power; and determining the real read-back signal parameter according to a single result of a read-back signal parameter obtained from the middle block of the successive blocks.
- [c15] 15. The writing power control method of claim 10 wherein the compact disc drive is a CD-R drive, and the target read-back signal parameter is a  $\beta$  value of a read-back signal according to a specification of the CD-R drive.
- [c16] 16. The writing power control method of claim 10 wherein the compact disc drive is a CD-RW drive, and the target read-back signal parameter is a  $\gamma$  value of a read-back signal according to a specification of the CD-RW drive.
- [c17] 17. The writing power control method of claim 10 wherein the compact disc comprises a lead-in area, and the target read-back signal parameter is retrieved from data stored in the lead-in area.
- [c18] 18. The writing power control method of claim 10 wherein the polynomial function is constructed from a polynomial curve fitting method.